Small Business Innovation Research/Small Business Tech Transfer

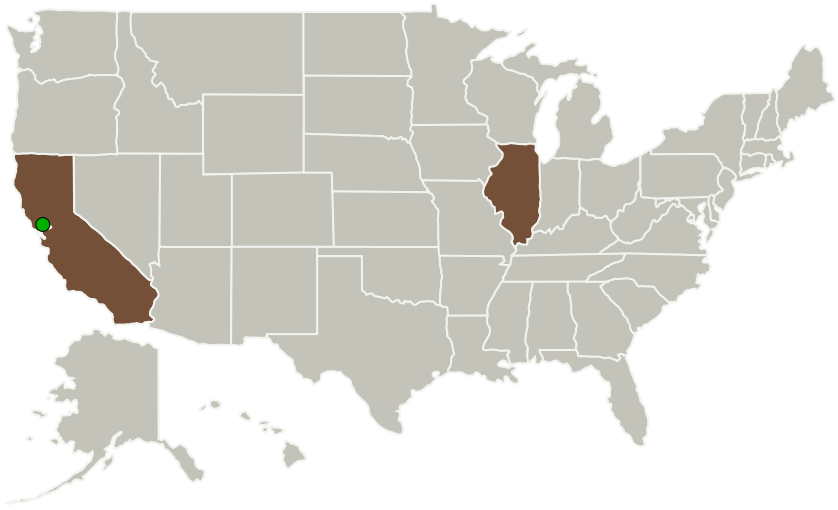
Next generation HgCdTe FPAs for high frame rate characterization of thermal protective systems, Phase I

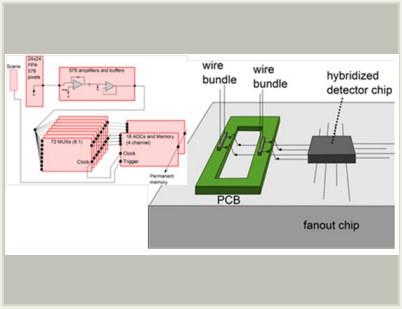
Completed Technology Project (2015 - 2015)

Project Introduction

Typical existing infrared (IR) focal plane arrays (FPAs) have high spatial resolution over large areas due to their high pixel counts, however they can only continuously operate at frame rates below 50 kfps. Such FPAs could be redesigned to achieve MHz frame rates by redesigning the read-out integrated circuit (ROIC) and reducing the format. By reducing the pixel count and increasing the pixel size, and by increasing the degree of parallel access to pixels, a high speed data link can be established for every pixel, allowing continuous operation at frame rates up to 1 MHz. A proof of concept architecture in the LWIR band has been demonstrated with off-chip room temperature read out electronics of 8x8 format. In this proposed effort, we will improve upon this design by demonstrating it for a larger format and a different IR band, and by increasing the signal to noise in the read-out electronics. In pursuing this path, we expect to establish in a Phase II effort a foundation for redesigning the traditional IR FPA, focusing on the ROIC.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
EPIR Technologies, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Bolingbrook, Illinois
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Illinois

Project Transitions

June 2015: Project Start

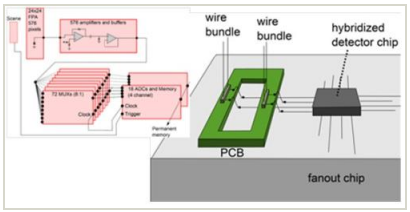
December 2015: Closed out

Closeout Summary: Next generation HgCdTe FPAs for high frame rate charact erization of thermal protective systems, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139280)*

Images



Briefing Chart Image
Next generation HgCdTe FPAs for high frame rate characterization of thermal protective systems, Phase I *(https://techport.nasa.gov/image/131761)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

EPIR Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

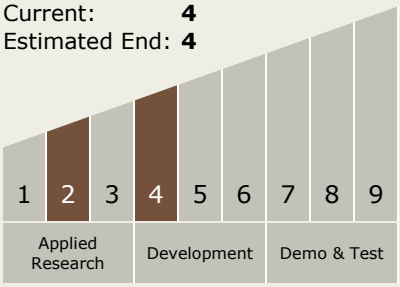
Carlos Torrez

Principal Investigator:

Christopher Buurma

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.4 Atmosphere and Surface Characterization

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System